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ABSTRACT

This booklet presents three brief papers that summarize three meta-analytic research syntheses of instruction for students with learning disabilities. The first paper is "Intervention Research for Students with Learning Disabilities" by H. Lee Swanson. Findings that resulted from a review of 272 studies are grouped into those on most effective forms of instruction; subject areas most affected by different instructional strategies; and other factors that influence achievement. The second paper is "The Effect of Instructional Grouping Format on the Reading Outcomes of Students with Disabilities" (Batya Elbaum, Sharon Vaughn, Marie Hughes, Sally Watson Moody, and Jeanne Shay Schumm). This analysis of 20 studies presents conclusions on results of students tutoring each other; effects of small group instruction; the outcomes of multiple grouping formats; and effects of length of time during which alternative formats are implemented. The third paper is "Effective Instruction for Learning Disabled or At-Risk English-Language Learners?" (Russell Gersten, Scott Baker, Susan Unok Marks, and Sylvia B. Smith). Recommendations address components of an effective English-language development program, the value of adapted forms of the instructional approaches identified in the effective teaching research with this population, and effective ways to merge content area instruction with English-language development instruction. (DB)

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Keys to Successful Learning:

A National Summit on Research in Learning Disabilities

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Improving Instruction for Students With Learning Disabilities

The Results of Three Research Syntheses

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Office of Special Education and Rehabilitative Services

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Research to Practice

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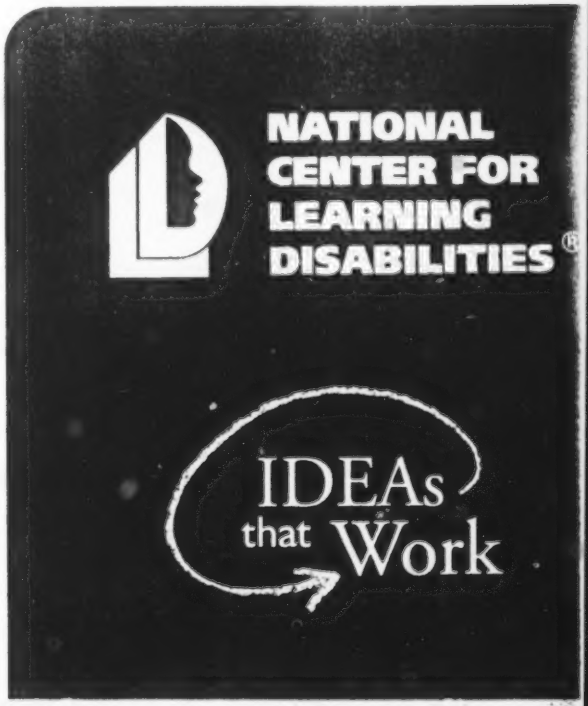

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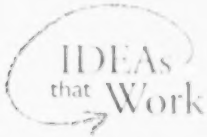

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The purpose of this initiative is to translate research and policy on learning disabilities into high standards for learning and achievement in the classroom, and to take action at the local, state and federal levels to ensure that all students, including those with learning disabilities, are afforded the highest quality education.

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Improving Instruction for Students with Learning Disabilities

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Intervention Research for Students with Learning Disabilities:

A Meta-Analysis of Treatment Outcomes

H. Lee Swanson, Ph.D., University of California - Riverside

Executive Summary

Background and Purpose

In the last 20 years, the number of children classified as having learning disabilities has increased substantially, from roughly three-quarters of a million in 1976 to more than 2.6 million in 1997. These children currently make up almost half of schools' special education population, yet it is still unclear which teaching strategies best help these children. Furthermore, a review of past literature reveals few systematic analyses of instructional approaches for students who have learning disabilities. This lack of clear direction creates confusion about how best to educate these students.

Clearly, students with learning disabilities are a heterogeneous group and **no general or single intervention can be recommended for these students**. However, this report can offer recommendations from its investigation of evidence derived from many different studies on teaching students with learning disabilities. In this meta-analysis we synthesize research on the effects of various forms of instruction intended to improve students' academics (e.g., reading, mathematics), cognition (e.g., problem solving), or behavior (e.g., social skills).

The meta-analysis includes 272 studies which met four criteria. Each study had to:

- Include learning-disabled students of average intelligence who were assigned to an experimental or a control instructional condition.
- Include information on how students with learning disabilities were selected.
- Explain treatment outcomes.
- Have no severe flaws.

We analyzed the effects for a range of studies that included both studies of a single area and studies that examined a mix of subjects across the following: instructional domains (e.g., reading, mathematics); sample characteristics (e.g., age, intelligence); intervention parameters (e.g., number of instructional sessions); and methodologies.

Findings

This synthesis examining research conducted over the last 30 years produced several findings related to intervention for students with learning disabilities. Unless otherwise noted, these findings come primarily from the group-design studies.

What forms of instruction were most effective?

- The most effective form of teaching children with learning disabilities combined components of direct instruction (teacher-directed lecture, discussion, and learning from books) with components of strategy instruction (teaching ways to learn such as memorization techniques and study skills). The main instructional components of this combined model include:
  - sequencing (e.g., breaking down the task, providing step-by-step prompts);
  - drill-repetition-practice (e.g., daily testing, repeated practice, sequenced review);
  - segmentation (e.g., breaking down skills into parts and then synthesizing the parts into a whole);
  - directed questioning and responses (e.g., teacher asks process or content questions of students);
  - control of task difficulty;
  - use of technology (e.g., computers, presentation media);
  - teacher-modeled problem solving;
  - small-group instruction; and
  - strategy cues (e.g., reminders to use strategies, think-aloud models).

Of these components, the one most linked to effect on student achievement was control of task difficulty (where, for example, the teacher provided necessary assistance or sequenced tasks from easy to difficult.) Another influential component was the use of small interactive groups of five or fewer students. A third strongly influential component was the use of structured questioning and directed responses, involving, for example, interactive questions and answers or the teacher directing students to ask questions and summarize.

- Children with learning disabilities perform closer to nondisabled (age-related peers) children when treatment includes strategy instruction. Not surprisingly, nondisabled students generally outperform learning-disabled students. Importantly, however, there was less difference between the performance of the two groups when learning-disabled students were exposed to treatments that included strategy instruction compared to competing treatments like direct instruction.

- In the area of reading, both phonics and whole word (whole language) instruction make a significant contribution to student achievement in reading. Neither clearly supersedes the other in terms of transfer measures (reading real words and comprehending text).

- Only a few instructional components successfully predict effects on student achievement. Although several instructional components seem to produce effects when studied independently (e.g., segmentation predicts outcomes on phonological measures), the results vary more widely when instruction reflects the variance shared across components. This happens because individual strategies typically do not appear in isolation in a classroom, and often their importance as predictors is enhanced in the context of other components.

What subject areas were most affected by different instructional strategies?

- Only studies in the areas of reading comprehension, vocabulary, and creativity met our threshold for having a large effect (when adjusted for differences in how the studies were conducted). We found moderate effects in the areas of cognitive processing (e.g., problem solving), word recognition, memory, writing, intelligence (e.g., performance on standardized tests), attitude/self-concept, phonics/orthographic skills (e.g., recognizing correct spelling), and global achievement (e.g., teacher grades, class ranking). We found relatively weak effects were found in the areas of spelling, mathematics, general reading, social skills, perceptual-motor processes (e.g., handwriting), and language processes (e.g., listening comprehension). However, single subject design studies found large effects in all subjects except for handwriting.

- Treatment effects are specific to the academic problems being addressed. If you look across academic subjects, the most effective model was a combination of direct instruction and strategy instruction. However, its effect was greater in reading than in non-reading measures, such as mathematics and social skills. Within the field of reading, this model is particularly effective for reading comprehension compared to reading recognition. We also found that bottom-up instruction (direct instruction only) was more effective than top-down instruction (strategy instruction only) on word recognition, but not on reading comprehension.

What other factors influence achievement?

- Different ways of identifying whether a child has learning disabilities or not (using either cut-off scores in tests or variation between student achievement and that predicted by an IQ test) will affect achievement outcomes. The results suggest that studies that used a cut-off score criteria (at or above 84 and reading scores below the 25th percentile) found smaller effects from the treatment. For both group and single-subject design studies, the model combining direct and strategic instruction yielded higher effect sizes when cut-off scores can be computed than when they cannot. For single-subject design studies, the combined model yields higher effect sizes for the lower IQ discrepancy studies when compared to those studies that report discrepancies, but with relatively higher IQ scores.

- Similarly, variations in how the studies were conducted can have a significant impact on treatment outcomes. Studies that account for differences from the control (non-treatment) condition in terms of setting (classroom and school), teacher, and number of instructional steps yield larger effects than studies that fail to control for such variations. A serious threat to interpreting treatment effects are studies that unfairly "stacked" the treatment condition with substantially more steps and procedures than the control condition. Here, although it was clear that how the study was conducted did have a strong influence on its findings, researchers found that there were still significant effects

related to various types of treatment, even with controls for the methodological factors.

Recommendations

- Researchers should investigate which treatment approaches are most effective and the causal processes by which they work. They also should pay attention to the interactions of instruction and learning disabilities characteristics.
- Teachers should combine direct instruction with strategy instruction. They should focus on task difficulty, small interactive groups, and structured questioning and directed responses.
- Teachers should match instructional techniques to the subject areas in which they are most effective. For example, reading comprehension should be taught with a combination of direct instruction and strategy instruction. Bottom-up instruction can be used for word recognition but not reading comprehension. Both phonics and whole word methods (whole language) should be used to teach reading.

The Effect of Instructional Grouping Format on the Reading Outcomes of Students with Disabilities:

A Meta-Analytic Review

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Executive Summary

Background and Purpose

American schools are educating an increasingly diverse student population. This diversity is present in students' cultural and linguistic backgrounds, behavior, and learning abilities. One of the greatest challenges that teachers face is to provide appropriate reading instruction for all students, including students with learning disabilities and behavior disorders.

For decades, schools assigned students with disabilities who needed specialized reading instruction to a part- or full-time special education classroom. The 1997 Reauthorization of IDEA provides support for opportunities to educate students with disabilities in the general education classroom to the extent appropriate and also to ensure these students' access to the general education curriculum. This raises the question of how best to organize the classroom and group students for instruction so as to maximize student achievement. Traditionally, students in regular classrooms were divided into several groups according to reading ability and were provided reading instruction within these groups. In the last twenty years, there has been considerable criticism of same-ability grouping on the grounds that this practice lowers self-esteem and motivation among students with reading problems and often widens the gap between high and low achievers. At the same time, there has been an increase in the popularity of alternative grouping practices such as cooperative learning and cross-age tutoring that are designed to accommodate individual differences while avoiding social stigmas.

As a result of inclusion and other reform movements in special education, increased collaboration between general and special educators, and the rise of new methods of grouping for reading instruction, educators need a comparison of the effects of different ways of grouping students with disabilities for reading instruction.

Findings

This study, a meta-analysis of 20 studies conducted from 1975 to 1995, examined the relationship between reading outcomes of students with disabilities and the grouping formats (i.e., pairing, small groups, multiple grouping formats) used for reading instruction. Most studies compared students who received instruction through one of these grouping formats with similar students who received "traditional" instruction delivered to the whole class. The researchers found that students who were taught in one of the alternative grouping formats had greater reading outcomes, on average, than students in a comparison group (nearly half a standard deviation higher). Thus, this research supports the use of alternative instructional groupings for teaching reading to students with disabilities.

What are the results of students tutoring each other?

- Researchers found clear benefits to tutoring both in cases when the students with disabilities acted as reciprocal tutors-tutees and in cases when they were only tutees. Acting as a reciprocal tutor does not appear to diminish the effect of peer tutoring, and may offer the additional benefit of boosting students' self-esteem through the teaching role.
- The average effect of cross-age tutoring was very high

for cross-age tutors but negligible for cross-age tutees. In the cross-age tutoring studies, tutors were in some cases students with disabilities and other cases regular education students. Hence, the lack of an effect for tutees cannot be explained entirely by the hypothesis that tutors who are students with disabilities lack the content knowledge or teaching skill to help their tutees.

Outcomes for students with disabilities varied depending on the particular focus of the reading instruction that was provided (for example, whether the focus was on word recognition or reading comprehension), as well as on how these outcomes were measured (for example, whether the test that students were given following the reading intervention was a test of decoding skills, oral reading of passages, reading comprehension, etc.). Future research is needed to clarify these issues.

What are the effects of small group instruction?

The study supports previous research which found that breaking students into smaller teacher-led groups (typically three to ten students) helps students learn significantly more than students who are not instructed in small groups. Other research suggests that small groups (three to four members) produce more positive results than larger groups (five to seven members). Smaller groups typically result in more efficient use of teacher and student time, lower cost, increased instructional time, increased peer interaction, and improved generalization of skills.

The authors suggest that the type of instruction provided in small groups and the materials used will affect the benefits to students with disabilities. Benefits are likely to be greater when instructional materials are tailored to the needs of different students. Students with disabilities may require different materials and more direct instruction than students without disabilities.

The role of the teacher in small group formats requires further research. Small groups can provide teachers with the opportunity to provide intensive, direct instruction, or they can be used as an opportunity for students to work collaboratively with one another. Further studies are needed to address the effects of different types of small group work in reading.

What are the outcomes of multiple grouping formats?

Average results from these studies showed that using combinations of grouping formats for reading instruction produces measurable reading benefits for students with disabilities. This finding is important because increasing numbers of teachers use diverse grouping formats in their classrooms. For example, teachers may use whole-class instruction for a part of each language arts period and have students work two days a week in pairs and another two days in small groups.

Did the length of time during which the alternative format was implemented impact the difference in outcomes between students taught using that grouping format and students in a comparison group?

The analyses revealed that the difference in outcomes between students taught in alternative formats and students in a comparison group was not related to the length of the intervention. Longer interventions were not, overall, associated with a greater difference between students in the alternative format and students in the comparison group.

Recommendations

Peer-mediated instruction in reading represents an effective complement to other instructional practices for students with disabilities. Peer pairing holds promise not only for improving reading outcomes but also for improving social relationships of students with disabilities. Teachers are encouraged to consider using well-documented and researched peer pairing interventions as part of their reading program.

When possible, teachers should engage students with disabilities as reading tutors for younger children. Outcomes should be monitored for tutees as well as tutors, to ensure that all children benefit.

Researchers need to conduct additional intervention studies that directly assess the effects of grouping on outcomes for students with disabilities. For example, an important question that can be addressed by such research is whether an intervention that is successful when conducted one-to-one can be equally successful when implemented in small groups. Further research can provide guidance on how the use of different instructional formats for reading instruction impacts both the academic achievement and social integration of students with disabilities.

Effective Instruction for Learning Disabled or At-Risk English-Language Learners:

An Integrative Synthesis of the Empirical and Professional Knowledge Bases

Russell Gersten, Scott Baker, Susan Unok Marks, Sylvia B. Smith,
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Executive Summary

Background and Purpose

The last 25 years have seen the largest wave of immigration in the history of the United States. Projections indicate that one student in four will be Latino in 2020, compared to only one in ten in 1982.

What is the best way to teach English-language learners? As the number of non-English speaking students in schools rises rapidly, this question presents a major concern to educators. Educators need a professional knowledge base on effective instructional practices for English-language learners. The urgency of this need is highlighted by NCES data indicating that the dropout rate for Hispanics is double that of African Americans and whites. Furthermore, an estimated one million students learning English in schools also have a learning disability. These students are at risk of receiving inappropriate special services or no such services at all.

We therefore conducted a synthesis of all relevant research on effective instruction for English-language learners. The guiding question for the synthesis was:

What do we know about effective teaching practices for English-language learners with disabilities or those at risk for school failure in the elementary and middle school grades (K-8)?

Goals of Research

Our primary goal was to conduct a rigorous examination of existing research to identify and understand those practices and instructional principles that produced a positive impact on student learning.

Unfortunately, we found only a small number of empirical studies (nine) that assessed the impact of specific instructional interventions or learning outcomes. Therefore, we supplemented our synthesis of existing research with additional research of our own (including analyses of discussions from five professional work groups made up of educators working with this population and researchers). Our second goal was to help educators better understand why some practices are more likely to be effective than others. For this purpose, we used a wide range of data sources (including the professional work groups). A third goal was to draw inferences from an examination of nine studies that met our criteria.

Findings

- Instructional approaches that expanded upon the current research base of effective teaching yielded stronger results than some of the seemingly innovative methods. This is especially true in reading and math. For example, quality and quantity of feedback provided was a critical determinant of achievement growth.
- The meetings and discussions with educators generated some promising instructional practices that are useful for defining best practices for teaching English-language learners. Among these are:
  - Using visuals to reinforce concepts and vocabulary;
  - Utilizing cooperative learning and peer tutoring;
  - Use of students' native language strategically when students are floundering;
  - Providing opportunities for students to practice speaking English in both formal and informal contexts throughout the day; and
  - Focusing on rich and evocative vocabulary words

during lessons so students remain engaged and challenged. The words can serve as vehicles for teaching literary concepts.

Current Challenges

- Extensive discussions with practitioners revealed that many current attempts to merge content area instruction with English-language development instruction are not well implemented. Current classroom practice typically fails to provide sufficient time for teaching English or sufficient opportunities for students to use oral language or to develop English writing skills. There also appears to be a tendency to over-emphasize conversational language use and to devote insufficient effort into building students' command of the abstract language required by many academic content areas.

- It is important to distinguish between the separate goals of language development and academic improvement. Our research indicates that increased language use in the classroom does not lead to increased academic improvement. In some studies, greater use of sophisticated language constructions in content-area classes was found to limit students' cognitive and academic growth. Because of limited and inconclusive research, we do not yet know which form of student engagement (e.g., speaking, listening, reading, writing, content activities, or a combination of these) provides more overall benefit for English-language learners. Further research needs to help clarify the link between academic growth and language learning.

How is research being used to guide practice?

We found only nine valid experimental studies for all academic areas in grades K-8. Currently, there is a limited empirical research base to guide practice. Although many articles and reports claim to describe effective practice, few provide the type of data necessary for firm conclusions.

Recommendations

For Practitioners

- We conclude that an effective English- language development program must include a balance of three components: (1) development of proficiency in "natural" language or conversation, (2) traditional emphasis on grammar and syntax, and (3) development of academic or decontextualized language.

- Teachers should use instructional approaches identified in the effective teaching research (e.g., Brophy & Good, 1986) and modulate them for English-language learners.

- Educators need to improve the way they merge content area instruction with English-language development instruction and provide both sufficient time for teaching English and sufficient opportunities for students to use oral language and writing. Key instructional practices for English-language development include introducing sets of no more than four to seven new vocabulary words per lesson, using visuals for reinforcement, using cooperative learning and peer tutoring, and making strategic use of the native language by allowing students to organize their thoughts in their native language before risking an English response.

For Researchers

The greatest need in future research of English-language learners (particularly in the area of special education) is for well-designed and valid intervention research. Existing studies are vague or unclear regarding how teaching methods were implemented, the level of implementation achieved, the language of instruction, and many other "context" variables that provide a rich picture of intervention research.

National Center for Learning Disabilities

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